Original Article

Seroprevalence of Hepatitis B and C Virus and HIV Markers among Blood Donors from Shahre-Kord, Iran (2004-2006)

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Kuwait Medical Journal 2008, 40 (4): 285-287

ABSTRACT

Objective: To determine the prevalence of HBV, HCV and HIV infection in voluntary blood donors from Shahre Kord, a central province of Iran, during 2004-2006
Design: Retrospective, descriptive and analytical study based on data from Serology Laboratory of the Blood Transfusion Center (BTC) at Shahre-Kord, Iran
Setting: The BTC, Shahre-Kord, Iran
Subjects: 35,124 apparently healthy voluntary blood donors
Intervention: Detection of HBsAg, anti-HBc, anti-HCV and anti-HIV markers in blood samples using immunoenzymatic tests and Western blotting, as determined by the BTC
Main Outcome Measures: Analysis of data obtained from the Serology Laboratory of the BTC, Shahre-Kord, Iran to determine prevalence
Results: Overall prevalence estimates were: 0.1% for HBsAg, 0.07% for anti-HBc, 0.2% for anti-HCV and 0.002% for anti-HIV antibody. There was a statistically significant increase in the overall prevalence of HBsAg and HBcAb (from 0.015% to 0.02%) and the prevalence of HCVAb (from 0.06% to 0.48%) during the study period ($p < 0.05$). Three male donors were co-infected by HCV and HBV.
Conclusion: This study suggests the need to investigate risk factors and risk groups for these infections in Iran. In the light of these results, an effective control and training program should be implemented.

KEY WORDS: blood donors, Hepatitis B virus, Hepatitis C virus

INTRODUCTION

Hepatitis B virus (HBV), hepatitis C virus (HCV) and human immune deficiency virus (HIV) infections are among the most important world public health problems representing a significant cause of morbidity and mortality, especially in developing countries. It is estimated that 350 million people worldwide (7%) are chronic HBV carriers[1,2] and 600,000 die each year from HBV-related liver disease or hepatocellular carcinoma[3,4]. HCV infection is found in approximately 160 million people (3%) out of the world population and is the most common chronic blood borne infection in the world[5-7]. In addition, prevalence of human immunodeficiency virus (HIV) is increasing everyday and it has become a disaster for humankind in some areas[4].

Their transmission occurs, mainly, through direct contact with blood, intravenous injections, transfusion, and sexual relations[8]. Over many years, hepatitis was the main cause of transfusion-associated chronic disease, liver cirrhosis, hepatocellular carcinoma, and death[9]. Both HCV and HBV infections are also of major public health concern and the prevention of these two viral diseases is important. The infected individuals are at risk of chronic liver disease (5 to 10% of HBV and more than 50% of HCV)[10]. HIV infection is one of the most important public health concerns. A number of risk factors such as needle sharing and drug injection have been identified for HIV infection[11].

For more than a decade, the screening of blood donors for HBV and HCV and HIV infection became obligatory in Iran as part of the control program, leading to a tighter control of blood samples used in transfusion. However, few studies have been carried out with wide variation in the prevalence of these viruses among Iranian blood donors. The prevalence of HBsAg, anti-HCV, and anti-HIV was 0.6, 1.1 and 0%, respectively in Kashan in 2000[12]. In Zahedan, the prevalence of HBsAg and anti-HCV was 5.19 and 1.9%, respectively[13]. Therefore, the aim of this study was to determine the prevalence of HBsAg, anti-HCV antibody and anti-HIV antibody in voluntary blood donors. This report presents the results of a retrospective study of screening blood donors in Char Mahal, a central province of Iran from 2004 to 2006.

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MATERIAL AND METHODS

This is a retrospective and descriptive study in which data were obtained from the Laboratory of the Blood Transfusion Center (BTC) of Share-Kord, Iran. The study was approved by the local ethical committee. The data included the markers of HBV (HbsAg and HBcAb), antibodies against HIV and HCV obtained from 35,124 blood donor referred to the center during 2004-2006. These samples were analyzed using immuno-enzymatic tests (ELISA; Ortho, USA and Western blotting; Gene Labs Diagnostics, Ltd). All HIV and HCV positive samples were confirmed by Western blotting. The HBsAg positive samples were confirmed by HBcAb.

RESULTS

Our results showed that out of 35,124 samples (blood donors), 38 (0.1%) were positive for HBsAg, 26 (0.07%) for anti-HBc, 74 (0.2%) for HCV specific antibody (confirmed by Western blotting) and one (0.002%) for anti-HIV antibody. The mean age of HBV and HCV infected individuals was 32.4 and 33.4 years respectively. Two out of the 38 (5.2%) HBV and three out of the 74 (4%) HCV positives were female. There was no significant relationship between HBV and HCV infections and gender ($p > 0.05$). Three male donors were co-infected by HCV and HBV. Also, there was no significant relationship between HBV / HCV co-infection and gender ($p > 0.05$).

Based on the results, the overall prevalence of HBsAg, anti-HBc, and particularly anti-HCV was significantly increased from 2004 to 2006. HBsAg and anti-HBc prevalence increased significantly from 0.015% in 2005 to 0.02% in 2006 ($p < 0.05$). Similarly, there was increase in anti-HCV prevalence among the blood donors from 0.06% in 2005 to 0.48% in 2006 ($p < 0.05$).

DISCUSSION

We verified that the prevalence of HBsAg, anti-HBc, anti-HCV and anti-HIV markers in Shahre-kord, Iran increased significantly from 2004 to 2006. In this study, the overall 0.1% HBsAg prevalence in the volunteer blood donors was lower than that in some other Iranian cities like Kashan (0.6%)[12] and Zahedan[13]. However, a comparison with developed countries, like Germany (0.16% in 1997-2002)[14], United States (0.07% in 2002)[15], Italy (0.003% in 1994-1997)[16], and Canada (0.012% in 2000)[17] showed that HBsAg prevalence in Shahre-Kord blood donors was higher. The overall prevalence for anti-core antibody (HBc) in the Shahre-Kord specimens (0.07%) was lower than that in Urmiae (0.57% [18], Kashan (1.1%)[12], Markazi (0.2%)[19], Zahedan(1.9%)[13] but was higher than in Italy (0.03%)[16].

The overall prevalence for anti-HCV marker in blood donors in Share-Kord during this period was 0.2%. This marker has been found to be variable in different regions of Iran, ranging from 1.9% in Zahedan[13] to 0.2% in the central province[19]. Although the HCV prevalence was not as high as in other cities in this country, it has increased since 2005. These data should alert the regional officials to focus action on HCV prevention in view of the unavailability of a vaccine.

As observed for the HBsAg and anti-HBcAb prevalence, the anti-HCV prevalence found in our region was higher than in developed countries like United States (0.25% in 2002)[20], Germany (0.1% in 1997/2002)[14], Canada (0.017% in 2000)[17] and Italy (0.002% in 1994/1997)[16].

Another agent, which has similar transmission route as HBV, is HIV. There is a potential hazard for everybody in the world because of the characteristics of the diseases[4]. Although in this study, the prevalence of HIV was 0.002%, Iran is not a sensitive area because of few visitors from other countries and cultural circumstances. However, there are young populations including drug-users who are not well informed about the disease and are among the most important high risk groups.

Comparing with other developed countries, HBV and HCV prevalence in Iran is high. This study also demonstrates that HCV infection is a serious problem in our region, which requires further study and greater attention on the part of federal government health authorities.

CONCLUSION

This study suggests that it is necessary to investigate risk factors and risk groups for these infections in Iran. In the light of these results, an effective control and training program for civilians should be implemented.

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